UNCERTAINTY AND REPRODUCIBILITY ISSUES RELATING TO IFE POWER PLANT PERFORMANCE

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THE IMPACT OF UNCERTAINTIES AND REPRODUCIBILITY ASSOCIATED WITH TARGET AND DRIVER PREPARATION AND DELIVERY MAY LEAD TO OFF-NORMAL CONSEQUENCES

- **Reduced Gain Shots**
- **Terminated Shots**
- **Dud Shots**
- **Rogue Shots**

A PARTIAL LIST OF TARGET PREPARATION AND DELIVERY REQUIREMENTS FOR LASER-DRIVEN, DIRECT DRIVE IFE

- **Provide ~ 500,000 targets per day with surface condition tolerance of ± 0.1%**

- **Inject and place the target at the chamber center with an accuracy of ± 5mm**

- **Align the target and the laser beams at their centerlines with an accuracy of ± 20 um**

A PARTIAL LIST OF LASER PREPARATION AND DELIVERY REQUIREMENTS FOR LASER-DRIVEN, DIRECT DRIVE IFE

- **Achieve a laser uniformity of at least 0.5%**
- **Achieve beam balance of about ± 1%**
- **Operate with low chamber gas pressure**
- **Achieve beam steering capability consistent with centerline alignment of ± 20 um**

PROPOSED APPROACH AND OBJECTIVES OF THIS STUDY

- **Develop as complete a list as possible of target and driver preparation and delivery requirements for the ARIES combinations of drivers and targets**

- **Establish uncertainty and reproducibility parameters and distributions for these requirements**

- **Perform statistical analyses to develop probability distributions for various shot outcomes**

- **Examine the impact of these shot outcomes on the performance of IFE power plant**